

**ART 34 ANDT****Claims**

1. A method for processing fish or fish fillets by removing at least a part of the bone area simultaneously as the fillet is skinned, the method comprising:

- form freezing the fish to be processed by combining blow-and touch-freezing, and
- removing the fish skin after the necessary form freezing is obtained,

wherein the form freezing comprises cooling the surface of a conveyor belt by an airflow, the conveyor belt in a freezer comprising drop-shape aluminium beam, lowering the temperature of the aluminium by airflow, such that the heat from the fish fillet is removed through touch freezing, and wherein the airflow from above and sidewise freezes that part of the fillet, which does not touch the aluminium beam, so that frozen shell is generated around the fillet.

2. A method according to claim 1, wherein the form freezing has the function that the adhesion in the fish-meat adjacent to the fish skin is larger than the adhesion between the fish-meat and the fish skin which follows in that by removing the fish skin no fish-meat is removed with the fish skin, and wherein the form freezing has also the function that the part of the bone area that is fastened to the fish skin is removed as the fish skin is removed.

3. A method for processing fish according to claims 1 and 2, wherein the remaining parts of the bone area are removed manually.

4. A method for processing fish according to any of the preceding claims, wherein the form freezing comprises fast freezing the outmost layer of the product so that the freezing is not extended towards the core of the fish or the fish fillet.

5. A method for processing fish according to any of the preceding claims, wherein the speed of the form freezing is such that it freezes 1-2 mm of the outmost layer of the fish.

6. A method for processing fish according to any of the preceding claims, wherein the temperature of the outmost layer is below  $-20^{\circ}\text{C}$ , while the core temperature of the fish-meat is larger than  $0^{\circ}\text{C}$ .

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7. A method for processing fish according to claims 1 or 2, wherein lowering the temperature of the fish fillet in a processing increases the value of the end product by decreasing damages due to temperature such as microorganism growth and chemical changes as a result of changes in enzyme activity.

8. A method for processing fish according to any of the preceding claims, wherein the form freezing of a fish fillet causes a lowering in the temperature during processing and increases the value of the product due to less handling during the processing such as looseness in the fish fillet.

9. A method for processing fish according to any of the preceding claims, wherein the form freezing of the fish fillet causes a lowering in the temperature during the processing.

10. A method for processing fish according to any of the preceding claims, wherein the form freezing increases the possibility of cutting the product into valuable products.

11. A method for processing fish according to any of the preceding claims, wherein the form freezing of the fish fillet results in less liquid loss in the product during the handling and the processing.

12. An apparatus for removing at least a part of the bone area simultaneously as the fillet is skinned by form freezing the fish to be processed using the combining blow-and touch- freezing method of claims 1 - 10, the apparatus comprising:

- cooling means for form freezing the fish, the cooling means further comprising:
  - conveyor belt, and
  - openings for airflow 22, 23, 24 for cooling the conveyor belt and the fish fillet,
- device for removing skin and pin bones, the device further comprising:
  - a conveyor belt
  - guidance for positioning the bones in the fillet
  - sensors, and

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- a skin-removing unit comprising a roller, a knife and a spooler shaft.

13. An apparatus according to claim 12, wherein the upper part of the conveyor belt comprises drop-shape aluminum beam 18 and 19 generating a smooth upper surface.

14. An apparatus according to claim 12, wherein the spooler shaft has a ridged surface and the spooler shaft is turning in a direction opposite to the roller for removing the skin away from the fillet.

15. A product processed with a method and apparatus according to any of the preceding claims.